

## FOREWORD

### EXPLORE, EXPERIMENT, EXPLAIN

The definition of research is rather sophisticated. Research is systematic investigation into and study of materials and sources etc. in order to establish facts and reach to new conclusions. More simply – we seek, we learn.



Really – like in the fairy tales – we are traveling on a road leading to our desired destination, the Kingdom of Far, Far away. Are we there yet? No. But step by step we may proceed, we may get closer. Even if we miss the way, we can learn from our failures.

One of the most peculiar mistakes emerged from a most precise research in the 17<sup>th</sup> century. Jan Baptista van Helmont, a Dutch scientist set up an experiment to explore the principles of plant nutrition. Helmont's willow experiment is often presented in its entirety because the description is so brief. Here is the first English translation from 1662 to refer to for the subsequent discussion.

“But I have learned by this handicraft-operation that all Vegetables do immediately, and materially proceed out of the Element of water onely. For I took an Earthen vessel, in which I put 200 pounds of Earth that hadbeen dried in a Furnace, which I moystened with Rainwater, and I implanted therein the Trunk or Stem of a Willow Tree, weighing five pounds; and at length, five years being finished, the Tree sprung from thence, did weigh 169 pounds, and about three ounces: But I moystened the Earthen Vessel with Rain-water, or distilled water (alwayes when there was need) and it was large, and implanted into the Earth, and leasht the dust that flew about should be co-mingled with the Earth, I covered the lip or mouth of the Vessel with an Iron-Plate covered with Tin, and easily passable with many holes. I computed not the weight of the leaves that fell off in the four Autumnes. At length, I again dried the Earth of the Vessell, and there were found the same two hundred pounds, wanting about two ounces. Therefore 164 pounds of Wood, Barks, and Roots, arose out of water onely.”

It was the first scientific plant analysis approach detecting physiology of plant growth. However the experiment had no plausible results, it can be assumed as the dawn of a new period. Hundreds of experienced scientists and learned landlords tried to find the secret of plant growth and development.

Justus von Liebig tried to find a chemical explanation with his classical barrel stave model. Sir John Bennet Lawes had an opposite approach focusing on plant growth. The scientific duel of these gentlemen is well known in the history of science. Both of them were right and

wrong at the same time just because of the diverse methodology applied. Until the invention of Jean Baptiste Boussingault related to the nitrogen cycle no one has ever realised that the only difference of the two conclusions was based on the assessment, whether the chemical processes were considered static or dynamic.

The advice of Hans Molisch the one time professor in plant physiology is pointing to the importance of interdisciplinary cooperation. He wrote as a motto of his handbook the following slogan: “to understand plants, the gardener has to attend the school of a chemist, and the chemist has to get acquainted with the work of a gardener”.

And it is the point where we come to a most important field of scientific research: the explanation. What sort of conclusions can be taken from scientifically accurate research results?

The mission scientific periodicals, like Columella is to provide floor for dissemination and discussion.

As the new editor-in-chief of the periodical I do hope, that the readers of this volume will benefit from the papers presented. Also, we may have a hope that our readers may contribute to the scientific results presented by the authors.

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editor-in-chief



